Americanization and its Limits: Theory and Practice in the Reconstruction of Britain's Engineering Industries, 1945-55

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A central problem confronting all West European economies after World War II was that of Americanization. How far should European industry be reconstructed in the image of the United States, unquestionably the dominant economic and military power of the postwar world? To contemporaries on both sides of the Atlantic, Americanization of industry meant above all mass production -- the high-volume manufacture of standardized goods using special-purpose machinery and predominately unskilled labor -- together with the host of "systematic" management techniques developed for its efficient administration. Beyond the intrinsic appeal of such methods to Europeans aspiring to emulate American productivity and abundance, moreover, US policy makers actively sought to promote their diffusion through the technical assistance programs and investment funds associated with the Marshall Plan.

Much of the recent literature on postwar Americanization has tended to assume without much supporting evidence that this process proceeded relatively smoothly and rapidly, at least in its narrowly economic and technological dimensions. The real barriers to Americanization, on this view, lay rather in the social, cultural, and political spheres, where European elites and popular classes each proved reluctant, to varying degrees and for different reasons, to embrace transatlantic models of labor-management relations, welfare provision, and mass consumption. Western Europe, as one influential formulation puts it, was only "half-Americanized" during the postwar period [18, p. 436]; but the design and manufacture of industrial products in such accounts is squarely allocated to the "Americanized" half. Even where the limits of industrial Americanization are recognized, as for example in Maguire's otherwise valuable study of postwar British design and marketing policies [21], the persistence of "pre-Fordist" production methods is taken to be a self-evident indication of backwardness and complacency, an avatar of and contributory factor in the subsequent decline of domestic manufacturing.

Significant differences between European countries can undoubtedly be discerned in the extent and forms of industrial Americanization during the postwar period. One could construct an international spectrum of attitudes towards the importation of American-style mass production methods with countries like France

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and Italy closer to the positive, enthusiastic pole and others like Britain and arguably West Germany closer to the negative, sceptical pole. There were also pronounced divisions among decision-making elites within each country, often within a single industry, as Ranieri for example has shown in the case of Italian steel [31]. Even in the United States itself, a growing body of work by Scranton and others has uncovered an impressive diversity of industrial practices beneath the monolithic image of mass production and scientific management propagated both by postwar apostles of the productivity gospel and by the Chandlerian school of American business history [33].

There is no space here to pursue further the fascinating theme of national variations in the response to postwar programs for the Americanization of European industry. This paper seeks instead to sketch out the contours of British debate about Americanization and reconstruction in a key sector of manufacturing -- the engineering or metalworking industries. Its central concerns are threefold. First, contrary to the claims of some recent historians [e.g. 5], I want to highlight the determined efforts during this period -- above all by government -- to push British industry towards the adoption of American-style mass-production methods. Second, I want to re-examine contemporary objections to these proposals -- some more prescient than others -- and reassess the practical impact of both on the reconstruction of British engineering. In so doing, finally, I want to call into question the causal link between the limits of Americanization and the subsequent decline of British manufacturing. For at a moment when American manufacturers themselves are struggling to respond to the challenges of new competitive strategies based on greater product diversity and productive flexibility, there can be little justification for considering mass production and systematic management as they were practiced in the United States during the 1940s and 50s as a universal model of industrial efficiency which other nations failed to embrace at their own peril.

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In Britain as in other European countries, domestic debates about Americanization of industry had a long history prior to 1945. From the 1890s onwards, British observers closely monitored the evolution of mass-production techniques in American industry and carefully considered their applicability to domestic economic conditions. While recognizing the cost reductions and economies of scale theoretically obtainable by following the American model, participants in these discussions drew attention to the practical advantages of more flexible methods based on the use of skilled workers and general-purpose machinery in catering for the varied and fluctuating markets characteristic of British engineering. They were also concerned about the inflexibility of special-purpose equipment, the high overhead costs of bureaucratic management, and the restrictive impact of standardization on product innovation. At the same time, however, British metalworking firms selectively appropriated certain features of American practice which could enhance product performance or productive efficiency without excessive loss of flexibility -- such as new machine tools, payment systems, and interchangeability of key parts -- and used these piecemeal innovations to maintain or expand their position in domestic and international markets [38].

The vast output and productivity of American industry during and immediately after the Second World War reopened this debate and gave renewed

impetus to British advocates of mass production. During the later years of the war, government planners, trade unionists and progressive industrialists put forward a variety of more or less far-reaching proposals for the reconstruction on mass production lines of important sections of British engineering such as motor vehicles and agricultural machinery. But it was during the postwar productivity drive that official efforts to promote the adoption of American methods in British manufacturing reached their apogee through government standardization campaigns, the transatlantic missions organized by the Anglo-American Council on Productivity (AACP), and the procurement policies of the nationalized industries.

During the initial phase of postwar reconstruction, the Labor government's central priorities were to maintain full employment and boost output by "manning up" key industries. By 1946-7, however, it had become apparent that labor reserves were drying up, while capital investment was both constrained by material shortages and export priorities and could not be expected to yield rapid results in any case. In the short term, therefore, increased output could only come from more efficient use of existing resources, and raising productivity accordingly moved to the center of Labor's economic objectives. The resulting productivity drive was spearheaded by Sir Stafford Cripps, Chancellor of the Exchequer and longstanding enthusiast of scientific management, who believed that factory reorganization and the diffusion of best practice could yield "twenty, thirty or even fifty 50 percent increases in output with lowered costs and higher pay for the operatives" [36, ch. 4; 26].

The productivity drive encompassed a wide range of policies aimed at improving the efficiency of British industry in both the short and long-term, from propaganda and exhortation through the diffusion of work-study, operations research and human relations techniques to public support for research and development [36, chs. 5-7]. Among the most important initiatives specifically directed at engineering was the promotion of product standardization. In November 1947, Herbert Morrison, chairman of the Cabinet Committee on Production, proposed that the Board of Trade should consider "measures for a speed up in standardization and variety reduction in British industry," including compulsory enforcement of dimensional standards for certain products. The Board of Trade responded by commissioning a detailed enquiry into the scope of efficiency gains achievable through standardization. Despite its authors' evident enthusiasm for all forms of rationalization, the enquiry concluded that reduction of product variety by itself yielded cost savings and output gains of only 5-10%; larger savings of 25-50% required much longer runs and heavy capital investment in new plant. "Standardization by the reduction of variety," concluded the Board, "is not a panacea for the lessening of costs;" and its report also underlined the attendant dangers of "sterilization of design", reduced consumer choice and loss of ability to cater for diverse export markets. True to its voluntarist traditions, therefore, the Board of Trade firmly rejected compulsory enforcement of standards except in cases of government procurement or public health and safety [27].

The attitude adopted by the Ministry of Supply, the department directly responsible for most of engineering, was altogether more positive. While well aware of the dangers cited by the Board of Trade, the Ministry was convinced that "the degree of standardization so far achieved in ...engineering...falls short of what can be done with advantage to productivity" [28]. In November 1948, therefore, the Ministry set up a Committee for Standardization of Engineering Products under Sir Ernest Lemon, a pioneering architect of railway standardization, to investigate

the scope for the reduction of variety in the industry and the role of government action in effecting it. After an extensive survey of domestic practice, which revealed a broad spectrum of sectoral variation, the Lemon Committee came down unequivocally in favor of greater standardization in British engineering. "There can be no doubt", argued its 1949 report, "that the relatively high degree of specialization and simplification in US industry (including the smaller firms), is a major reason for their higher industrial productive efficiency." Correctly applied, the committee contended, specialization, simplification and standardization should neither inhibit technical progress in design, impose uniformity on consumers nor result in a loss of markets at home or abroad. Thus designs could be periodically altered to take account of technical advance; a reasonable variety of final products could be built up from standardized materials, parts and components; and customers could be induced to accept standard articles through the vigorous use of price incentives [25, pp. 5-6, App. III].

Despite these robust conclusions, however, the policy recommendations advanced by the Lemon Report were decidedly modest. Like the Board of Trade, the Lemon Committee rejected compulsory enforcement of industrial standards as both impracticable and likely to produce "serious rigidities and inefficiencies". The British Standards Institution should expand its staff, streamline its procedures and play a more active role in initiating new standards, receiving in return an increased public grant, but industrial standardization must ultimately depend on the voluntary consent of private manufacturers. Government, the Committee concluded, should encourage standardization through a combination of public exhortation, tax allowances for capital investment, and above all the purchasing policies of the nationalized industries, which consumed some 30% of non-exported engineering output [25, pp. 13-14, 17-18, Apps. I-II].

Closely associated with the standardization campaign was the work of the Anglo-American Council on Productivity. Established in 1948 as a response to US criticisms of British industry in the context of Marshall Aid, the Attlee government also saw the AACP as a means of devolving greater responsibility for the success of the productivity drive onto business and labor organizations. The AACP's central activity consisted of organizing joint missions by British businessmen and workers to visit US plants to investigate the sources of superior American productivity and disseminate their findings. Most of the missions focused on individual industries, including a wide range of engineering sectors, but a number of specialist teams were also set up to study key aspects of American practice such as product simplification, design for production, materials handling, production control and management accounting [9, ch. 9; 36: ch. 7].

Broadly speaking, the AACP missions concerned with engineering confirmed prior expectations of a substantial gap between American and British productivity and practice. At the same time, however, the size of the gap identified was far from uniform across engineering as a whole: thus the standard contrast between US mass production and British craft practice was sharpest in diesel locomotives and internal combustion engines, but scarcely evident in metalworking machine tools and woodworking machinery, with other sectors such as valves, pressed metal and electrical control gear somewhere in between. While most of the reports paid tribute at least in passing to the virtues of the American way of life and the efficiency-mindedness of US workers, the main factors adduced to explain Anglo-American productivity differences were altogether more concrete. Foremost

among these were the larger size and greater homogeneity of the American market, which made possible the longer runs that justified the fuller use of mass-production techniques such as special machinery and tooling, mechanical handling devices and subdivision of labor. But the US productivity lead was not attributed simply to the influence of favorable environmental conditions. Thus the reports emphasized the active commitment of American engineering companies to the "three charmed 'S's of high productivity": simplification, standardization and specialization. Even smaller firms, they found, tended to specialize on a narrow range of products, and high-production tooling was common on much smaller batches than in Britain. US manufacturers, moreover, constantly sought to expand demand for their standard lines by "making the market" through a combination of research, advertising and price discrimination against special orders. The effectiveness of mass production in US industry, the reports further argued, also depended on the careful application of systematic management methods such as standard costing, work study and production planning, as too did the success of labor policies such wage incentives and job evaluation.

But the practical message conveyed by the AACP productivity missions for the reorganization of British industry was decidedly contradictory. Like the productivity drive itself, the AACP reports held out the prospect of large and rapid efficiency gains through the adoption of American production methods; but the more radical the changes proposed in domestic practice, the more distant the potential benefits. On the one hand, therefore, the productivity teams highlighted the importance of inherently long-term measures such as reduction of product variety, greater mechanization and automation, and the development of systematic management capabilities. On the other hand, however, many of their recommendations understandably tended to focus on short-term measures which could be introduced within the existing organization of production, such as better tooling, work study or incentive payment schemes. Paradoxically, therefore, at the same time as the AACP missions apotheosized American practice as a model for British industry, they also helped to circumscribe the scope of domestic reform initiatives.

How did British businessmen and engineers respond to these Americanization initiatives of the AACP and the Labor government? While there is no space here for an extended analysis, a number of observations can nonetheless be made on the basis of the contemporary sources. First, the reactions of business organizations such as the Federation of British Industries, trade associations, and the employer representatives on the Engineering Advisory Council were strongly colored by their desire to limit the scope of state intervention in the private sector. The FBI, as Tiratsoo and Tomlinson have shown, regarded much of the AACP's work as a thinly-veiled criticism of British management, while business representatives of all types were anxious to ward off any moves towards compulsory standardization, which many saw as the thin end of the wedge of government control over their product policies preparing the way for eventual nationalization [36, ch. 7; 29; 30]. Second, as one might expect, there were pronounced sectoral variations in attitudes towards the "three Ss": thus, for example, producers of intermediate goods for other businesses saw greater scope for standardization and reduction of variety than those producing finished goods for consumer markets [3; 22; 1, pp. 7-8]. Thirdly, although British businessmen were well aware of the potential cost and productivity advantages of mass production, their prewar

reservations about its commercial and technological disadvantages in the domestic context had by no means been dispelled. Thus many business commentators on the AACP and Lemon reports emphasized the difficulties of imposing standard products on diverse export markets, the resulting need for continued productive flexibility, and the constraints imposed by excessive standardization on design changes and technological innovation [29; 22; 7; 12, 5/5/50].

These criticisms of the postwar Americanization drive received their fullest and most cogent formulation in the influential trade journal *The Engineer.* While welcoming the search for domestic productivity improvement through the study of foreign industry, the journal was sceptical whether "knowledge gained of American methods of production is necessarily applicable to British practice", while also doubting whether "all methods that prove profitable across the Atlantic will also prove possible here." "In the US," it went on to observe,

> there has never existed that great pool of skilled labor that exists in Europe. The American manufacturer has thus often been forced by circumstance to adopt mechanized methods of production by unskilled or partly skilled labor. High capital costs have been involved and the price of the articles produced has not always been low [12, 5/5/50].

Even more important than these differences in British and American patterns of labor supply, contended *The Engineer*, were differences in the structure of their product markets.

> The American manufacturer has available to absorb his products a very large and homogeneous home market. He can therefore afford to rationalize, to invest large capital in specialist plant and to increase output per head thereby. But the British manufacturer serves a relatively small home market and has also to depend to a far higher degree than the American on satisfying variegated export markets which look to European rather than American manufacturers to supply them with the 'tailor-made' goods they require [12, 5/6/49].

In many sectors, the journal argued, Britain's real competitors were other Europeans rather than the United States, and the system of sending out teams from British industries to learn the methods of other countries needed to be extended geographically. "Much of real value," it concluded, could

> be learnt from a study of other plants in Western Europe, which are confronting problems which are much more similar to our own than those facing American producers. After all, America is not the only prosperous country in the world. The Swiss, for example, have built up a rich and varied industrial culture at least as attractive as the American [12, 5/5/50].

Among the central paradoxes of the productivity debate was its comparative neglect of Germany, Britain's major prewar competitor in most of the engineering

industries. Postwar intelligence missions which inspected German factories were impressed by the skills and training of the labor force at all levels, from engineers and technicians to foreman and manual workers, but not by production methods and organization, which they regarded as inferior not only to that of American firms but also of well-run British companies. "Thus as regards the internal organization of German industrial concerns we have very little to learn," concluded one specialist investigation of production control [6, p. 8]; and this finding was echoed in the reports of other intelligence teams dealing with individual metalworking sectors such as aircraft instruments, machine tools, and power presses. Yet German engineering exports grew extremely rapidly during the 1950s, particularly to Western Europe, and by the middle of the decade at the latest German machinery manufacturers had recaptured their prewar share of world markets, largely at British expense [20, ch. 6; 23, pp. 396-424].

What practical impact, finally, did the postwar Americanization drive have on the British engineering industries? Here again, a comprehensive answer would require rather more space than that available here, but some broad-brush conclusions can nonetheless be sketched out. A number of the most ambitious experiments with standardization and mass production occurred within the public sector, especially the nationalized industries. In 1947, for example, the Ministry of Supply and the Central Electricity Board issued a statutory order limiting turbo-alternators for domestic power generation to two standard sizes, 30 and 60 megawatts [16, pp. 24-5]. Similarly, among the first acts of newly-nationalized British Railways in 1948 was the development of a standard family of steam locomotives for use on all its constituent lines [15, pp. 87-90]. In housing, too, both the wartime coalition government and its Labor successor sponsored the construction of prefabricated steel and aluminum dwellings by metalworking manufacturers seeking new applications for mass-production methods [13, ch. 2].

Yet the results of these experiments proved largely disappointing even to their architects, vindicating many of the economic and technological objections raised by contemporary critics. Thus the sizes selected for standard turbo-alternators turned out to be too small to give maximum operating benefits, handicapping the efficiency of British electricity generation in comparison to its European counterparts during the 1950s and 60s, while the CEB's orders were not large enough to yield any significant scale economies for domestic power-plant manufacturers [16, 104-10; 32]. On the railways, too, investments in a new generation of standard steam locomotives helped to slow down the introduction of technologically superior diesel and electrical models, raising rather than reducing operating costs in the longer term [15, p. 88]. In housing, finally, prefabricated metal dwellings proved more expensive than conventional building methods, as well as requiring larger quantities of scarce raw materials, and their construction rapidly came to a halt after the withdrawal of special government subsidies to non-traditional producers in 1948 [13, chs. 2-3].

The impact of the Americanization drive on the private sector can be examined both at a collective and an individual level. At the level of collective organization, trade associations in many sectors of British engineering launched a series of more or less ambitious initiatives for the promotion of standardization and productive efficiency, from the adoption of common specifications for components, equipment sharing and exchange of technical information to cooperative R&D, order pooling and joint export marketing. Such voluntary collective initiatives were

aimed in no small part at forestalling the possibility of state compulsion, and they proved most successful where the authority of trade associations could be reinforced by that of government, as in aircraft where the Ministry of Supply required the use of standard components drawn up by the Society of British Aircraft Constructors for all military contracts [30; 12, 1/28/49].

At the level of the individual firm, as one might expect, the practical impact of Americanization varied widely depending, among other things, on sectoral patterns of demand and the strategic choices of top management. Thus, for example, AACP follow-up reports found much greater willingness to standardize and invest in special-purpose machinery and tooling among manufacturers of valves, an intermediate good for which demand was large and rapidly expanding, than among makers of diesel locomotives, a complex finished product for which the domestic market (unlike in the US) remained extremely narrow [6; 7]. Within each sector, too, some firms were vastly more enthusiastic than others about the commercial prospects of mass-produced goods. A noteworthy case in point was that of Standard Motors, which reconverted its wartime shadow aircraft factory (with government assistance) for high-volume production of standardized cars and tractors using a single interchangeable engine (a strategy which ultimately foundered on design flaws and faulty market projections among other factors) [35].

But even in firms where top management was less sanguine than Standard's Sir John Black about betting the company on the success of a single model, this period often saw a narrowing of product ranges and concomitant introduction of special-purpose machinery and tooling. Thus the National Advisory Council for the Motor Manufacturing Industry claimed that the number of basic models in 1948 would be reduced to 42 from 136 in 1939, with an even greater reduction in the number of body variations from 299 to 40 [24]. Both Austin and Morris, who merged to form the British Motor Corporation in 1952, invested heavily in automated transfer machinery during the early 1950s, an example followed by other domestic vehicle manufacturers later in the decade [37, pp. 30-3, 147-51; 4, Mar.-Apr. 1953, pp. 113-24, 163-74]. In other sectors such as electrical engineering, internal combustion engines, and even machine tools, contemporary examples can be found of amalgamations between firms; standardization of products and/or components; specialization of plants on particular classes or models of equipment; and the adoption of flow-line layouts and other high-volume production techniques [10; 2, pp. 33-4; 34, pp. 250-6; 4, Aug. 1953, pp. 332-44].

On balance, however, the systematic pursuit of such strategies by British engineering firms during the late 1940s and early 1950s was circumscribed by a combination of factors from raw material shortages, shifting export quotas, and macroeconomic uncertainty on the one hand to the high profits obtainable from existing products and processes during the postwar sellers' market and persistent reservations about the commercial and technological benefits obtainable through wholesale adoption of American production techniques on the other. Thus British firms often modified US manufacturing methods to handle a wider range of products in smaller quantities through innovations similar to those later made famous by the Japanese such as mixed-model assembly, quick tooling changes, and unit construction of automatic machinery from standard, recombinable elements. Like the Japanese, too, such British manufacturers also sought to reduce buffer stocks as far as possible by careful synchronization of operation sequences and frequent component deliveries from outside suppliers, though they did not hit on

any equivalent to Toyota's "kanban" system for "pulling" parts through production as and when they were required at each subsequent stage [37, pp. 21-3, 42-7, 82-4, 150, 172-5; 4, Sept. 1946: 384-95, Mar. 1947: 90-7, Sept. 1951: 329-35, Mar. 1953: 113-15].

Perhaps the most successful transatlantic import was work study, which diffused rapidly through British industry during the 1950s. But the enthusiastic response to these techniques was itself revealing, since unlike other American manufacturing practices, work study both built on prewar domestic experience with incentive payment systems and could easily be "added on" to existing production systems without the need for far-reaching reorganization [36, pp. 147-52; 14, pp. 118-20; 11].

Despite its enormous ideological influence, therefore, the practical impact of the Americanization drive on British engineering remained surprisingly limited during the first postwar decade. It was only between the mid-1950s and the mid-1970s, as a massive wave of government-promoted mergers and takeovers transformed the structure of the industry, that British engineering companies decisively abandoned their indigenous model of productive organization in favor of imported management techniques such as multi-divisionalization and measured day work. Far from reviving its competitive fortunes, however, this putative Americanization of British engineering was associated instead with a rapid loss of market share both abroad and at home, resulting in a steep decline of domestic production and employment. By the 1980s, ironically, the competitive difficulties of British engineering firms, like those of the Americans themselves, were frequently attributed to their inability to match the standards of product innovation and productive flexibility set by the Germans and the Japanese in meeting the demands of increasingly diverse and volatile international markets [17].

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